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TITLE: Combinations of prostaglandins and brimonidine or derivatives thereof

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INVENTOR-INFORMATION:

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US-CL-CURRENT: 514/392; 514/530, 514/573, 514/912, 514/913

CLAIMS:

Having now described the invention, what is claimed is:

1. A method of treating a mammal suffering from glaucoma or ocular hypertension, comprising administering to the mammal a therapeutically effective amount of a prostaglandin and a therapeutically effective amount of an alpha adrenergic agent of formula (I) ##STR13##

wherein each Y is independently selected from the group consisting of N, N--CH3, O, S and C--R.sub.1 ; R.sub.1 is hydrogen, lower alkyl or oxo; R.sub.2, R.sub.3 and R.sub.4 are independently selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkenyl; n is an integer from 1 to 3; and a broken line beside a solid line indicates either a single or a double bond, provided that two double bonds are not on the same carbon in the case when n=1, and their pharmaceutically acceptable salts and esters as appropriate wherein said method provides neuroprotection.

2. The method of claim 1 wherein the prostaglandin is selected from the group consisting of PGF.sub.2.alpha., PGE.sub.2, PGE.sub.1, prostacyclin, 15(S)-methyl-PGF.sub.2.alpha., 16,16-dimethyl-PGF.sub.2.alpha., 15(S)-methyl-PGE.sub.2,16,16-dimethyl-PGE.sub.2, 17,18,19,20-tetranor-16-phenoxy-PGE2, 17,18, 19,20-tetranor-16-phenoxy-PGF.sub.2.alpha., 18,19,20-trinor-17-phenyl-PGE.sub.2, 18,19,20-trinor-17-phenyl-PGF.sub.2.alpha., the free acid and lower alkyl esters of PGF.sub.2.alpha., wherein the omega chain has been replaced with phenylethylsulfonamidomethyl-, trimoprostil, RS-84-135, rioprostil, S-1033 (15-deshydroxy PGF.sub.2.alpha., sodium salt), S-747260, nocloprost, CS-412, YPG-209, K-10134, cloprostenol, fluprostenol, luporstiol, etiproston, tiaprost, SQ 27986, ZK 138519, 13,14-dihydro-ZK 138519, ZK 118182, 13,14-dihydro-ZK 118182, ZK 110841, 13,14-dihydro-ZK 110841, PhXA41 (latanoprost), RO-221327, HR-466, HR-601, ONO-1206, UFO-21, 11-deoxy-PGE.sub.2, 11-deoxy-PGF.sub.2.alpha., 11-deoxy-16,16-dimethyl-PGE.sub.2, 11-deoxy-15(S)-methyl-PGE.sub.2, 11-deoxy-15(S)-methyl-PGF.sub.2.alpha., misoprostol, enisoprost, MDL-646, CL-115,574, CL-115,347, TR-4161, TR-4752, TR-4367, CP-27987, sulprostone, gemeprost, alfaprostol, delprostenate, prostalene, fenprostalene, CL-116,069, ONO-995 and RO-229648, and their pharmaceutically acceptable esters and salts, as appropriate.

3. The method of claim 2 wherein the prostaglandin is selected from the group consisting of PGF.sub.2.alpha. -11-pivalyl ester, the 1-amido-15-methyl ether of PGF.sub.2.alpha. 1-ethylamido-18,19,20-trinor-17-phenyl-PGF.sub.2.alpha., PGF.sub.2.alpha. -1-ethyl ester, PGF.sub.2.alpha. -1-isopropyl ester, the acid and isopropyl ester derivatives of PGF.sub.2.alpha. wherein the omega chain has been replaced with phenylethylsulfonamidomethyl-, as represented by the structure below: ##STR14##

RO-229648, SQ 27986, ZK 138519, 13,14-dihydro-ZK 138519, ZK 110841, 13,14-dihydro-ZK 110841, PhXA41, and 18,19,20-trinor-17-phenyl-PGF.sub.2.alpha. -1-methyl ester.

4. The method of claim 1 wherein the alpha adrenergic agent is further selected from formula (I) to contain the groups of formula (II) wherein R2 is bromine or methyl and all other variables are defined as in claim 1. ##STR15##

5. The method of claim 3 wherein the alpha adrenergic agent is brimonidine (5-bromo-N-(4,5-dihydro-1H-imidazol-2-yl)-6-quinoxalinamine).

6. The method of claim 4 wherein the alpha adrenergic agent is brimonidine (5-bromo-N-(4,5-dihydro-1H-imidazol-2-yl)-6-quinoxalinamine).

7. The method of claim 1 wherein the prostaglandin is the 11-pivalyl ester of PGF.sub.2.alpha. and the alpha adrenergic agent is brimonidine.